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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Noelle Mistretta

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MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606

EXAMINER

OLSON, ERIC

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1623

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/758,142	Applicant(s) MISTRETTA ET AL.	
	Examiner Eric S. Olson	Art Unit 1623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 11-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 30 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/13/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

This office action is a response to applicant's communication submitted September 13, 2007 wherein claims 1, 3, and 31 are amended and the specification is amended to indicate continuity. This application claims benefit of provisional application 60/442154, filed January 20, 2003, and foreign application FR0300488, filed January 17, 2003.

Claims 1-31 are pending in this application.

Claims 1-10, 30, and 31 as amended are examined on the merits herein.

Applicant's amendment to the specification, submitted September 13, 2007, has been fully considered and is found to be persuasive to remove the objection to the specification for lacking continuity information as this information is now provided in the first paragraph of the specification. Therefore the objection is withdrawn.

Applicant's amendment, submitted September 13, 2007, with respect to the objection to claim 31 for depending from a withdrawn claim, has been fully considered and found to be persuasive to remove the objection because the claim has been amended to independent form. Therefore the objection is withdrawn.

Applicant's amendment, submitted September 13, 2007, with respect to the rejection of instant claims 1-4, 10, 30, and 31 under 35 USC 112, second paragraph, for reciting a trade name as a claim limitation, has been fully considered and found to be

persuasive to remove the rejection as the trade name has been deleted from the claims.
Therefore the rejection is withdrawn.

Claim Objections

Claim 4 is objected to because of the following informalities: In particular, the claim recites the grammatically incorrect phrase, “under the specified in claim 1.” This is probably intended to be “under the **conditions** specified in claim 1.” Appropriate correction is required.

The following new grounds of rejection are introduced:

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. This claim requires a compound having a PAD chromatogram wherein “the peak observed with the polysaccharide aminated according to a **conventional amination method** being reduced so as to be **no more than a simple shoulder** of the preceding [pneumosamine] peak.” Neither the claims nor the specification give a limiting definition of what is a conventional versus and unconventional amination method, or what is a simple shoulder of the pneumosamine peak. Therefore the claims are indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5-7, 9, 10, 30, and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Moreau. (US patent 6596861, of record in previous office action, previously published on September 21, 2000 as WO00/55210).

Moreau discloses methods for using microwave-assisted reactions to couple a polysaccharide to a polypeptide by reductive amination. (column 3, lines 18-50) Various reducing agents such as borohydride and cyanoborohydride can be used to reduce the imine linkage. (column 6 lines 44-51) Polypeptides useful in this method include capsular polysaccharides of *Streptococcus pneumoniae*, for example of serotype 5. (column 6 lines 58-61) The polysaccharides can be conjugated to various polypeptides including immune response enhancing polypeptides such as diphtheria and tetanus toxoids. (column 8, lines 27-36) This process of reductive amination without prior borohydride reduction is equivalent to the reductive amination protocol disclosed on p. 16, lines 10-17 and p. 34, example 1 in the instant specification which is used to produce a conjugate of structure II' according to claims 1, 2, 5-7, and 9. Therefore the structure of the resulting conjugate and its MNR and chromatographic properties are seen to be inherent properties of the *Streptococcus pneumoniae* type 5 conjugates

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disclosed by Moreau. Any properties exhibited by or benefits provided the composition are inherent and are not given patentable weight over the prior art. A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties Applicant discloses and/or claims are necessarily present. See *In re Spada*, 911 F.2d 705, 709, 15 USPQ 1655, 1658 (Fed. Cir. 1990). See MPEP 2112.01. Therefore the claimed invention is anticipated by Moreau.

The following rejections of record in the previous office action are maintained:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moreau (US patent 6596861, of record in previous office action, previously published on September 21, 2000 as WO00/55210) in view of Jansson et al. (Cited in PTO-892)

It is noted that the ¹³C NMR profile and chromatography profile of aminated pneumococcus type 5 capsular polysaccharide is claimed in the preamble of claims 1-4. In the aminated pneumococcus type 5 capsular polysaccharide claims, said profiles are considered to be inherent properties of aminated pneumococcus type 5 capsular

polysaccharide, and therefore do not carry any patentable weight towards the claimed compound. Also, the method by which said compounds are produced does not have any patentable weight towards the claimed compound.

Moreau teaches a method for the reductive amination of polysaccharide useful in a process for conjugating polysaccharides to polypeptides (co1.1, lines 1-4). Moreau discloses the aminated capsular polysaccharide of *Streptococcus pneumoniae* of serotype 5 (col. 6, lines 60-61). Regarding claims 10, 30 and 31, the prior art discloses that the aminated polysaccharide can be conjugated to a polypeptide per se (co1.8, lines 60-61). Moreau also discloses the reductive amination of acidic (negatively charged) polysaccharide (co1.10, Example 1). Moreau discloses the pharmaceutical composition of said compounds and their conjugates thereof (co1.10, lines 24-29). The prior art is silent in disclosing the specific expanded formula which corresponds to pneumococcus type 5 capsular polysaccharide.

Jansson teaches the repeating-unit structure of *Streptococcus pneumoniae* type 5 capsular polysaccharide composed of glucose, N-acetylated fucosamine, N-acetylated pneumosamine (2-acetamido-2,6-deoxytalose), glucuronic acid and Sug (2-acetamido- 2,6-deoxyhexose-4-ulose) (page 101, abstract). Jansson discloses the ^1H and ^{13}C -NMR spectra characterizing the polysaccharide structure (page 103, fig. 1 and page 107). Jansson also discloses borohydride reduction of *Streptococcus pneumoniae* type 5 capsular polysaccharide to obtain the product having similar immunological activity, which can also be used as a vaccine, and suggests that this product would

have a superior stability and reduced base-lability. (page 107, last para. to page 108, lines 1-3; page 108, last paragraph)

With regard to claims 5-9, wherein the repeating units are 90% and 95%; and A is represented by C=O or CHOH, it would be within the scope of the artisan in this art to optimize them through routine experimentation of reductive amination of a polysaccharide in view of cited prior arts. Additionally, the at least 95% reduced product of claim 8 corresponds to the borohydride-reduced polysaccharides described by Jansson et al., while the structure of claim 9 where A is C=O corresponds to the non-borohydride-reduced polysaccharide prepared as described by Moreau without borohydride reduction.

It would have been obvious to person having ordinary skill in the art at the time the invention was made to produce conjugates of *S. pneumoniae* type 5 capsular protein with a carrier polypeptide by reductive amination according to Moreau et al., either with or without prior borohydride treatment, thus producing either conjugates of the A = CHOH structure II" or the A = C=O structure II', and to incorporate this conjugate into a pharmaceutical composition, such as a vaccine. One of ordinary skill in the art would have been motivated to produce these compounds and compositions because Moreau teaches a method for the reductive amination of polysaccharide useful in a process for conjugating polysaccharides to polypeptides; and Jansson teaches reduced *Streptococcus pneumoniae* type 5 capsular polysaccharide that has reduced degradation and browning on storage. The motivation is provided by Moreau, the prior art suggests that reductive amination of a polysaccharide of interest provides the

product retaining essential antigenic determinants within the polysaccharides which is extremely important in the preparation of a conjugate vaccines having the essential structure and conformation of the component materials (col.2, lines 57-64). One of ordinary skill in the art would reasonably have expected success because the chemical transformations described by Moreau and Jansson are well within the ordinary and routine level of skill in the art.

Therefore the invention taken as a whole is *prima facie* obvious.

Response to Argument: Applicant's arguments, submitted September 13, 2007, with respect to the above ground of rejection have been fully considered and not found to be persuasive to remove the rejection. Applicant argues that Moreau is not prior art because it was commonly owned with the instant application at the time of the invention. However, Moreau is prior art under 35 USC 102(b) as the specification of Moreau was published on September 21, 2000 as PCT international application WO00/55210. Therefore the rejection is deemed proper and maintained.

Conclusion

No claims are allowed in this application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric S. Olson whose telephone number is 571-272-9051. The examiner can normally be reached on Monday-Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia Anna Jiang can be reached on (571)272-0627. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Eric S Olson/
Examiner, Art Unit 1623
2/22/2008

/Shaojia Anna Jiang/

Supervisory Patent Examiner, Art Unit 1623